R A D I O N I C S

D7112 Control/Communicator

Operation and Installation Manual

Notice

The material and instructions covered in this manual have been carefully checked for accuracy and are presumed to be reliable. However, Radionics, Inc., assumes no responsibility for inaccuracies and reserves the right to modify and revise this manual without notice.

It is our goal at Radionics to always supply accurate and reliable documentation. If a discrepancy is found in this documentation, please mail a photocopy of the corrected material to:

Radionics, Inc.,
c/o Technical writing Dept.
1800 Abbott Street
P.O. Box 80012
Salinas, CA 93912-0012

Radionics
c/o Customer Service
1 Park Gate Close, Bredbury
Stockport, Cheshire, SK6 2SZ, England

FCC Notices

Part 15

This equipment generates and uses radio frequency energy. If not installed and used in accordance with the manufacturer's instructions, it may cause interference to radio and television reception. It has been tested and found to comply with the specifications in Part 15 of FCC rules for Class B Computing Devices.

If this equipment causes interference to radio or television reception - which can be determined by turning the equipment on and off - the installer is encouraged to correct the interference by one or more of the following measures: 1) Reorient the antenna of the radio/television. 2) Connect the AC transformer to a different outlet so the control panel and radio/television are on different branch circuits. 3) Relocate the control panel with respect to the radio/television.

If necessary, the installer should consult an experienced radio/television technician for additional suggestions, or send for the "Interference Handbook" prepared by the Federal Communications Commission. This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, stock number 004-000-00450-7.

Part 68

This equipment complies with Part 68 of FCC rules. A label contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

The Radionics D7112 Control/Communicator is registered for connection to the public telephone network using an RJ38X or RJ31X jack.

The ringer equivalence number (REN) is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5). To be certain of the number of devices that may be connected to the line, as determined by the RENs, contact the telephone company to determine the maximum REN for the calling area.

Part 68 (Continued)

If the D7112 Control/Communicator causes harm to the telephone network, the telephone company will notify you in advance. If advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

If trouble is experienced with the D7112 Control/Communicator, please contact Radionics Customer Service for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request that you remove the equipment from the network until the problem is resolved. User repairs must not be made, and doing so will void the user's warranty.

This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line service is subject to state tariffs. (Contact your state public utilities commission for information.)

FCC Registration Number: AJ9USA-65062-AL-E

Ringer Equivalence: 0.1A 0.2B

Service Center in U.S.A.:   Radionics, Inc.,
1800 Abbott Street
P.O. Box 80012
Salinas, CA 93912-0012
(800) 538-5807

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Introduction

[handwritten: old alpha bits]
[handwritten: for Hard wired]
[handwritten: For RF]
[handwritten: can do 5 not 4]

D7125 Module
Interface for RF Transmitters and
D710 RF Command Center

D8125X Module
Interface for D8129 OctoRelay,
D8126 and D8127 POPITs

D8129 OctoRelay
Provides alarm and
auxiliary relay output by
area
(Other functions available)

D8132 Battery Charger
Required for more power if you
connect more than four command
centers to the D7112.

D7112

Area 1 - Account #0111

On-Board Points 1 - 4
Off-Board Points 9 - 15

1 Supervised D1254 Command Center

Area 4 - Account #0333

Off-Board Points 36 - 48

4 Unsupervised D1254 Command Centers

Area 2
Area 3 > Account #0222

On-Board Points 5 to 8 assigned to area 2
Off-Board Points 16 to 35 assigned to area 3

Areas arm and report independently under
the same account number

1 Supervised D1254 Command Center for
each area

This diagram shows only one of many possible system configurations.

Figure 1: D7112 System Configuration Example

Points

The Radionics D7112 Control/Communicator panel provides up to 48 separate points of protection. Each point is programmed individually with several options to custom-fit the protection to your installation. Point programming parameters determine the system's response to open and shorted conditions on the sensor loop.

Points 1 to 8 are located on the D7112 circuit board (on-board points). Point 1 is a powered sensor loop you can use for either two-wire smoke detectors or glass break detectors. Points 2 to 8 are standard sensor loops. The remaining 40 points are off-board points. You can use wired POPIT points and RF Transmitter points on one D7112 Panel.

The D8126 and D8127 wired POPIT points (and the D8129 OctoRelay) require the D8125X POPEX module. RF Transmitter points require the D7125 RF Receiver Interface.

Areas and Accounts

You arm and disarm the D7112 panel by area. The panel supports up to four separate areas. You assign each point of protection to one area. You can assign all points to a single area or spread them out over the four areas.

Assigning an account number to an area creates an account. Assigning each area its own account number creates four separate accounts in one D7112 panel. Assigning the same account number to different areas groups them together in a single account.

Other area options include: exit tone and delay, separate fire and burglary bells, and multiple opening and closing windows.

Communicator

The Radionics D7112 Control/Communicator panel uses a built-in digital communicator to send reports to the receiver. The panel transmits reports in either the Modem II or BFSK format. Your D6500 receiver must have software revision 6.00 (or greater) for its MPU and line cards to accept Modem II reports from the D7112. Power your receiver off and on to print the software revision numbers.

The D7112 connects to an RJ31X jack for phone line seizure. Connection to the RJ31X complies with FCC regulations for using the public telephone network. You can program the panel to direct reports to three separate phone numbers. Adding the D728 module to your D7112 system allows you to connect and supervise a second phone line.

Command Centers

The D7112 can supervise up to four command centers. The panel transmits a serial device trouble report, SDI FAILURE in the Modem II format or TROUBLE ZN D in the BFSK format, if it loses communication with a supervised command center. You can add more than four command centers but they can not be supervised.

The available power, number of supervised command centers, number of areas, and number of types of command centers you intend to use determine the total number of command centers you can connect to the D7112. See *Command Center* in the *D7112 Program Entry Guide* (74-06274-000) for complete details on command center options.

D1254 Alpha III Command Center

The D1254 Alpha III Command Center offers complete system control and annunciation for the D7112. The D1254 features an illuminated keypad, a 16-character English language display, and a built in speaker that offers several distinct warning tones. DIP switches on the D1254 assign an address (1 to 4) to the command center. You assign addresses to areas in the Command Center Assignments section of the program.

D710 Handheld RF Command Center

The D710 Handheld RF Command Center is a small, lightweight, wireless, command center that you can carry in a pocket or purse. The D710 performs arming and other basic system functions. The D710 command center requires the D7125 Receiver Interface Module.

Keyswitch

You can use a maintained or momentary closure device (keyswitch) connected to port J1 to arm and disarm Area 1. Assign point 9 to Area 1 and program it with a point code beginning with 4 or 5 to use this feature. There are powered LED outputs available for arming and point status. See *Arming Devices* in this manual for instructions and additional keyswitch options.

Event Buffer

The D7112 holds up to 20 events in its event buffer (high level memory) for quick and easy access. The user can view these events from the D1254 Command Center.

Event Log

The D7112's log holds up to 70 events. You can view the log at a D1254 Command Center, or upload it to a D5300 Remote Account Manager II (RAM II).

EMI/Lightning Transient Protection

The D7112 maintains the Radionics high level of quality and field dependability. Its design significantly reduces ElectroMagnetic Interference and malfunction generally caused by lightning.

Programming

Use either the Radionics D5200 Programmer, or the D5300 Remote Account Manager II (RAM II) to program the D7112. Refer to the *D7112 Program Entry Guide* (74-06274-000) for programming options.

Other Features

- Supervision of AC (primary power), battery charge (secondary power), and one or two telephone lines. Install the D728 Dual Phone Line Module to use a second phone line.
- Automatic system test reports
- Remote access for programming, diagnostics, and log uploads using the Radionics D5300 Remote Account Manager II (RAM II)
- The *D7112 Program Entry Guide* (74-06274-000) describes the D7112's many programmable features.

Before You Begin

Before you begin the installation of the D7112 you should be familiar with the operation of the D5200 programmer or the RAM II remote programmer.

Have the following documents handy as you read through this manual:

- D7112 Program Entry Guide (74-06274-000)
- Security System Owner's Manual (74-06196-000)

Installation

D7112 Assembly

The Radionics D7112 Control/Communicator panel is shipped assembled from the factory. You receive the following parts with your D7112 panel.

1. **Literature Pack**
   * D7112 Installation Manual (74-06195-000)
   * D7112 Program Record Sheet (74-06102-000)
   * Technogram: Smoke Detectors Compatible with the D7112 (73-06116-000)
   * One 1.8K Ω end of line resistor
   * Seven 1K Ω end of line resistors
   * Two 14", 18 AWG, color-coded battery leads

2. **D7112 Assembly**
   * D7103 Enclosure
   * D101 Lock and Key
   * D7112 Circuit board (mounted in the enclosure)
   * Faceplate shield
   * D1640 Transformer

D7112M

The D7112M package includes the D7112 circuit board mounted on a steel mounting skirt and the *Literature Pack* listed above. The mounting skirt allows you to install the D7112 in the enclosures listed below.

* D8103 Universal Enclosure (gray)
* D8108A Attack Resistant Enclosure (gray)
* D8109 Fire Enclosure (red)

Refer to the *Installation Guide for UL and Fire Applications* section to determine the appropriate enclosure for your application. The D7112M does not include a transformer.

Use the D7112M for two battery installations: The D7103 enclosure is designed for single battery applications. If you plan on using two D126 batteries with the D7112, use the D7112M and one of the enclosures listed above.

Ordered Separately

Order the following to complete the D7112 installation.

* D126 Battery
* D161 Phone Cord

If you are using the D7112M, order a D1640 transformer in addition to the items above.

Mounting The D7103 Enclosure

RF Receiver has location requirements: The D7125 RF Receiver Interface Module has its own location requirements that can affect your choice of location for the enclosure. See the *D7125 Operation and Installation Manual* (74-06168-000) for details.

The D7103's door is removable: To make mounting and servicing the D7103 easier, open the door and slide it up and off the hinges.

Follow the procedure below to mount the enclosure and circuit board assembly.

1. Remove the door from the enclosure.
2. Remove the necessary knockouts to run the wires into the enclosure if you haven't already done so.
3. Mount the enclosure in the desired location. Use all four mounting holes. See Figure 2.
4. Run the necessary wiring throughout the premises and pull the wires into the enclosure.
5. Connect earth ground to the panel before making any other connections. See *Earth Ground.*
6. Slide the door back on the hinges.
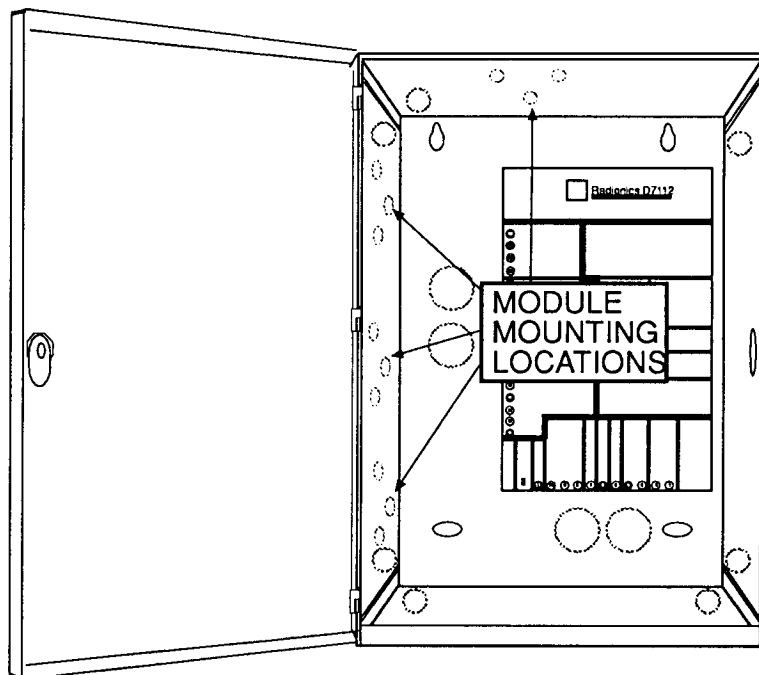
Figure 2: D7103 Enclosure

Earth Ground   Terminal   🔟⓵

To help prevent damage from electrostatic charges or other transient electrical surges, connect terminal 11 to earth ground before making any other connections to the panel. A grounding rod or cold water pipe are recommended earth ground references. Do NOT use telephone or electrical ground for the earth ground connection. Use 16 AWG wire when making the connection. Your ground reference should show less than 2 Ω resistance to a verified ground reference. Do not connect any other terminals to earth ground.

Wiring the D7112

Follow the instructions below to finish the installation of the D7112.

1. Make the earth ground connection to terminal 11 first. See *Earth Ground* above.

2. Connect the transformer and battery so the battery can charge as you install the detection devices and command centers. See *Transformer Installation* and *Battery Installation* in the *Power Supply* section.

3. Install detection devices and command centers at their locations throughout the premises. This manual contains instructions for wiring the on-board points to detection devices and for wiring the command centers. Instructions for the off-board points are found in the instructions packaged with the modules. Do NOT make the connections at the panel end of the wiring yet.

4. ***Power down first:*** Power down the D7112 by unplugging the transformer and battery. Radionics recommends that the D7112 be powered down when installing modules or relays, or when making wiring connections.

   Set time and date after power down: Whenever you power down the panel you have to set the time and date at a D1254 Command Center. See the *Security System Owner's Manual* (71-06196-000) for instructions. The time and date can also be set from the RAM II remote programmer.

5. Install and wire any modules required for your installation. See *Installing Modules* below. Connect the on-board point and command center wiring to the D7112.

6. ***Test for overload:*** Plug in the transformer and leave the battery disconnected. Wait one minute. If the green CPU LED goes out and the yellow Battery LED begins flashing slowly (1 second on, 1 second off), the power supply is overloaded. See the *Power Output* section.

7. Connect the battery and program the panel. Use the D5200 Programmer or the RAM II remote programmer. See the *D7112 Program Entry Guide (74-06274-000)* for programming details.

8. Test the panel and all devices for proper operation.

   Power down the panel for 1 minute to clear the event log and buffer after testing.

Installing Modules

See the *Specifications* section for a list of compatible modules. You can install up to four modules in the D7103 Enclosure. Follow the procedure below.

1. Power down the D7112 by unplugging the transformer and battery.

2. Align the module with any of the four mounting locations. See Figure 2. Using the three mounting screws provided with the module, fasten the module in place.

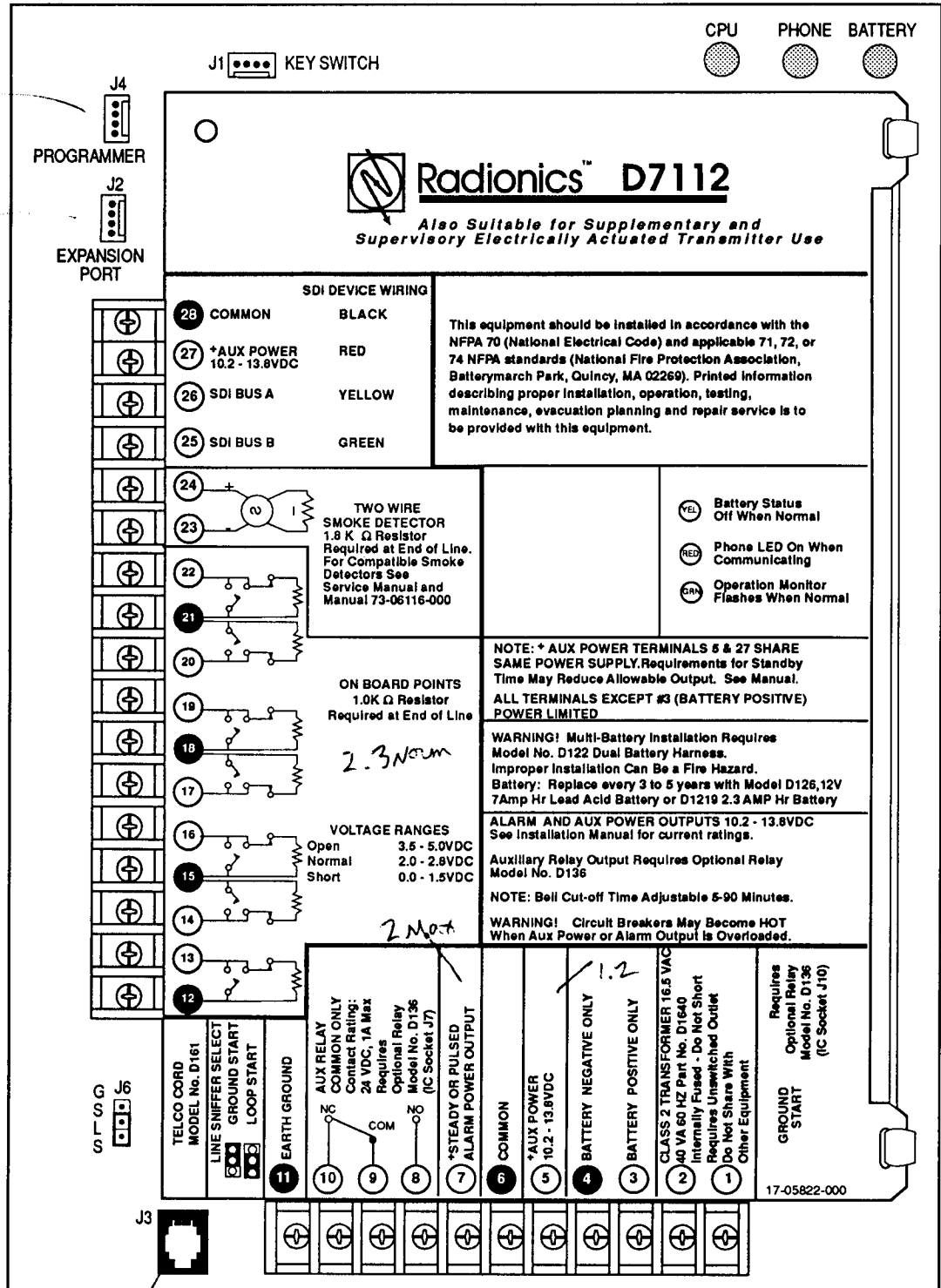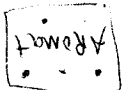   ***Install the D7125 in the top module location only:*** See Figure 2.

3. Connect the module as described in the module's installation instructions.

wireless as last Module

No Reset anymore

0,0 PEX

Relay upside Down

Armed

Phone

CPU   PHONE   BATTERY

J1 [••••]   KEY SWITCH

PROGRAMMER   J4

EXPANSION PORT   J2

Radionics™ D7112
Also Suitable for Supplementary and Supervisory Electrically Actuated Transmitter Use

SDI DEVICE WIRING

Terminal		
28	COMMON	BLACK
27	+AUX POWER 10.2 - 13.8VDC	RED
26	SDI BUS A	YELLOW
25	SDI BUS B	GREEN

This equipment should be installed in accordance with the NFPA 70 (National Electrical Code) and applicable 71, 72, or 74 NFPA standards (National Fire Protection Association, Batterymarch Park, Quincy, MA 02269). Printed information describing proper installation, operation, testing, maintenance, evacuation planning and repair service is to be provided with this equipment.

TWO WIRE SMOKE DETECTOR 1.8 K Ω Resistor Required at End of Line. For Compatible Smoke Detectors See Service Manual and Manual 73-06116-000

(YEL) Battery Status Off When Normal

(RED) Phone LED On When Communicating

(GRN) Operation Monitor Flashes When Normal

ON BOARD POINTS 1.0K Ω Resistor Required at End of Line

2.3 Norm

VOLTAGE RANGES
Open   3.5 - 5.0VDC
Normal 2.0 - 2.8VDC
Short   0.0 - 1.5VDC

2 Mot

NOTE: + AUX POWER TERMINALS 5 & 27 SHARE SAME POWER SUPPLY. Requirements for Standby Time May Reduce Allowable Output. See Manual.

ALL TERMINALS EXCEPT #3 (BATTERY POSITIVE) POWER LIMITED

WARNING! Multi-Battery Installation Requires Model No. D122 Dual Battery Harness. Improper Installation Can Be a Fire Hazard. Battery: Replace every 3 to 5 years with Model D126, 12V 7Amp Hr Lead Acid Battery or D1219 2.3 AMP Hr Battery

ALARM AND AUX POWER OUTPUTS 10.2 - 13.8VDC See Installation Manual for current ratings.

Auxiliary Relay Output Requires Optional Relay Model No. D136

NOTE: Bell Cut-off Time Adjustable 5-90 Minutes.

WARNING! Circuit Breakers May Become HOT When Aux Power or Alarm Output is Overloaded.

G J6
S
L
S

Terminal	Label
TELCO CORD MODEL No. D161	
LINE SNIFFER SELECT GROUND START LOOP START	
11	EARTH GROUND
10	AUX RELAY COMMON ONLY Contact Rating: 24 VDC, 1A Max NC Requires Optional Relay Model No. D136 (IC Socket J7)
9	COM
8	NO
7	*STEADY OR PULSED ALARM POWER OUTPUT
6	COMMON
5	+AUX POWER 10.2 - 13.8VDC
4	BATTERY NEGATIVE ONLY
3	BATTERY POSITIVE ONLY
2	CLASS 2 TRANSFORMER 16.5 VAC 40 VA 60 HZ Part No. D1640 Internally Fused - Do Not Short Requires Unswitched Outlet Do Not Share With Other Equipment
1	GROUND START Requires Optional Relay Model No. D136 (IC Socket J10)

1.2

17-05822-000

J3

Figure 3: D7112 Circuit Board

Power Supply

Primary Power
Terminals ① ②

Installing the Transformer
A 16.5 VAC, 40 VA internally fused transformer (Radionics model D1640) is the primary power source for the D7112.

Do not short the terminals of the transformer: Shorting the terminals opens the internal fuse causing permanent failure. Connect the transformer to terminals 1 and 2 of the panel before plugging it into the power source.

Use 18 AWG stranded wire to connect the transformer to the panel. Wire length should be kept as short as possible (maximum length 50 feet). Only plug the transformer into an unswitched, 120 VAC, 60 Hz power outlet. Secure the transformer to the outlet with the screw provided.

Never share the transformer with other equipment: Foreign grounds on the AC input damage the D7112 power circuit.

AC wiring can induce both noise and low level voltage into adjacent wiring. Route phone and sensor loop wiring away from any AC conductors, including the transformer wire. Route data wiring away from AC and phone wiring.

Primary (AC) Power Circuit
The AC power circuit provides 1.5 Amps of rectified AC power to the panel. Transient suppressors and spark gaps protect the circuit from power surges. This protection relies on the ground connection at terminal 11. Make sure you connect terminal 11 to a proper ground. See *Earth Ground.*

Secondary Power
Terminals ③ ④

Description
A 12V, 7 Ah sealed lead-acid rechargeable battery (Radionics D126) supplies power for auxiliary and alarm outputs, and powers the system during interruptions in primary (AC) power.

Lead Acid Batteries ONLY: The D7112 charging circuit is only calibrated for lead-acid batteries. Do not use gel-cell or nicad batteries.

Extra Batteries Increase Back-up Time: To increase battery back-up time, connect a second 12V, 7 Ah battery in parallel to the first battery to form a 12V, 14 Ah battery. Use a D122 Dual Battery Harness to ensure proper and safe connection. You can use the D8132 Battery Charger Module to connect two additional batteries for a total of four. See the *D7112 Standby Battery and Current Rating Chart* in this manual for battery standby time calculations.

Optional enclosure required for two batteries: The D7103 is designed for single battery applications. If you plan on using two D126 batteries with the D7112 use the D7112M and the D8103, D8108A, or D8109 enclosure.

Secondary Power (Continued)

Battery

Installation

Place the battery upright in the base of the enclosure. Connect the black battery lead from the literature pack to terminal 4, and then to the negative (-) side of the battery. Connect the red battery lead from the literature pack to terminal 3, and then to the positive (+) side of the battery.

> ***Warning, High Current Arcs Possible:*** Although the panel is protected against polarity reversal by a circuit breaker in series with the battery circuit, terminal 3 can create high current arcs if shorted to other terminals or the enclosure. Use caution when working with terminal 3. Always disconnect the positive (red) battery lead from the battery before removing it from terminal 3.

Replacement

Radionics recommends battery replacement every 3 to 5 years under normal use. Exceeding the maximum auxiliary and bell output ratings or installing the transformer in an outlet that is routinely switched off causes heavy discharges. Routine heavy discharges can lead to premature battery failure.

Supervision

During a primary power failure (AC power loss), the battery supplies all power to the security system. When the battery drops to 11.8 VDC, the panel, if programmed for power supervision, transmits a low battery report, a BATTERY LOW in the Modem II transmission format or TROUBLE ZN 9 in the BFSK transmission format.

Investigate low battery reports right away. If primary (AC) power is off and the discharge continues, the panel becomes inoperative when the battery voltage drops below 10 VDC. Deep discharge can damage the battery.

Battery Charging Circuit

Float Charge

The float voltage for the battery charging circuit is 13.8 VDC at up to 1.5 Amps. The actual current available for charging is found by deducting the continuous current load for all devices powered by the panel from 1.5 Amps. Include modules connected to the expansion port (J2), and any devices (including command centers) connected to terminals 5 and 27.

AC Power Failure

The D7112 indicates an AC power failure when the power at terminals 1 and 2 is missing for 15 seconds. AC restoral occurs 15 seconds after the power returns to terminals 1 and 2.

If the battery charge falls below 10.0 volts during an AC power loss, the panel shuts down. The displays shut off at any D1254 command centers connected to the panel. When AC power returns, the panel begins operating.

Secondary Power (Continued)

Battery Discharge/Recharge Schedule

Discharge Cycle

13.8 VDC	Charging float level
11.8 VDC	Battery trouble report
10.0 VDC	Panel shuts down until AC is restored.
	Event log clears.

Recharge Cycle

AC ON	Battery charging begins, battery trouble and AC restoral reports sent.
12.8 VDC	Battery restoral report sent, battery float charged.

[handwritten margin note: will lose Log when Power Down]

Circuit Protection

Three self-resetting thermal circuit breakers protect the power output circuits from shorts. The circuit breakers are thermal rated and open at 3 to 5 Amps. If the panel is programmed for power supervision, a low battery report, BATTERY LOW or BATTERY MISSING for Modem II, or TROUBLE ZN 9 for BFSK, is transmitted when a short is sustained.

Battery Status LED (Yellow)

The yellow Battery Status LED shows the condition of the battery. See Figure 3 for the location of the LED on the Circuit board.

[handwritten margin notes: Load Shed; Disconnect Batt & Smth If crashes / aux power To √]

- A yellow LED flashing in step with the green LED indicates that battery voltage is below 11.8 VDC. You can program the D7112 to activate the sounder at the command centers on a low battery condition. See *Power Supervision* in the *D7112 Program Entry Guide* (74-06274-000).

- A yellow LED flashing on when the green LED is flashing off indicates the battery is missing.

- A flashing yellow LED with the green CPU LED off, indicates a low battery condition. Battery voltage dropped below 10.0 volts causing the panel to shut down.

- A slow flashing (1 second on, 1 second off) yellow LED with the green CPU LED off indicates a power supply overload condition. The panel detects the battery as missing and the power supply cannot meet the power demand on the panel. The panel is shut down.

  Power down after overload: Power the panel down to reset it after a power supply overload condition. The event log clears when you power down the panel.

- A steadily lit yellow LED indicates that the connections to the battery are reversed.

  Power down after reversed battery: Power the panel down to reset it after reversing the battery. The event log clears when you power down the panel.

- The battery status is normal when the yellow LED is off.

Relays

Plug-in Relays

Insert optional D136 plug-in relays into sockets J7 and J10 to enable the Auxiliary Relay and Ground Start functions of the D7112. These relays are rated for 1A at 24 VDC and for 2A at 12 VDC. The relay sockets are under the faceplate on the lower left corner of the circuit board and are labeled as follows:

J7 - AUX RELAY

See *Relays* in the *D7112 Program Entry Guide (74-06274-000)* for details on the operation of this relay. There is continuity between terminals 9 and 10 when the relay is not activated. There is continuity between terminals 8 and 9 when the relay is activated. If you use the D8129 OctoRelay, this on-board auxiliary relay is disabled.

J10 - GROUND START

Refer to the *Telephone Circuit Parameters* section for details on the operation of this relay.

Installation

Power down the D7112 before inserting the D136 relays. The plug-in relays are shorter than the sockets they plug into. See Figure 4. You can install them in either the left or right end of the socket.

Upside down is correct: The labelling on the D136 is upside down when the relay is correctly installed. You should not rely on the labelling to install it. Check for the side with three legs. The three legs go on the bottom side.

Incorrect insertion does not damage the relay or the D7112, however the related circuits do not function properly.
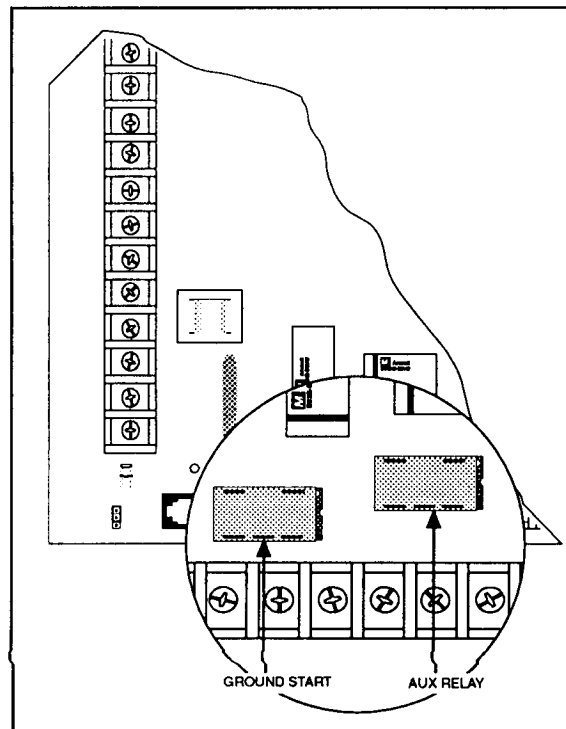

Figure 4: Plug-In Relays

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D8129 OctoRelay

The D8129 OctoRelay allows you to assign relay functions by area. Alarm output, auxiliary relays, sensor reset, arming status, point status, alarm memory, and remote functions (Command 54) are available. Using the OctoRelay disables the on-board auxiliary relay. See the *D7112 Program Entry Guide* (74-06274-000) for programming details. You must install the D8125X module to use the OctoRelay with the D7112. See the *D8125X Operation and Installation Manual* (74-06178-000) for installation instructions.

Configuring the D8129 OctoRelay

Review the *Relays* section of the *D7112 Program Entry Guide* (74-06274-000) to determine which relay functions you wish to use. The DIP switch on the OctoRelay determines the function of the relay outputs. You may need to install more than one OctoRelay to enable all the functions you want to use. Table 1 shows the switch settings for each function.

The first six relay functions appear in the table in pairs with one DIP switch setting for each pair of functions. The first function in the pair is assigned to OctoRelay outputs 1 to 4. Relay output 1 is assigned to area 1, relay output 2 to area 2, relay output 3 to area 3, and relay output 4 to area 4.

The second function is assigned to relays 5 to 8. Relay output 5 is assigned to area 1, relay output 6 to area 2, relay output 7 to area 3, and relay output 8 to area 4.

The *Security System Owner's Manual* (71-06196-000) provides end-user instructions for the remote (COMMAND 54) functions. The last eight relay functions are panel wide summary functions. Each function is assigned to one relay output.

Relay Function from Program Entry Guide	Relay Output D8129 CctoRelay	DIP Switch Setting D8129 OctoRelay
Area Bell Relay	1 to 4	Off-On-On-On-On
Area Auxiliary Relay	5 to 8	
Area Sensor Reset	1 to 4	On-Off-On-On-On
Area Master Armed	5 to 8	
Area Loop Status	1 to 4	Off-Off-On-On-On
Area Alarm Memory	5 to 8	
Command 54 Relays	1 to 8	On-On-Off-On-On
AC Failure	1	Off-On-Off-On-On
Battery Trouble	2	
Phone Line Trouble	3	
Communication Failure	4	
Watch Mode	5	
Summary Fire Trouble	6	
Summary Trouble	7	
Any Area Perimeter Armed	8	

Table 1: D8129 OctoRelay DIP Switch Settings

D8129 OctoRelay (Continued)

Relay Outputs

Each OctoRelay output provides a Form C dry contact rated for 1.0A at 12 VDC. Normally open, common, and normally closed terminals are available for each relay. When an individual relay is activated, there is continuity between the normally open and common terminals. When the relay is not activated, there is continuity between the normally closed and common terminals.

Installation

Set the DIP switch on the OctoRelay before you install it in the enclosure. See *Configuring the D8129 OctoRelay*. You can install the OctoRelay in the D7103 enclosure (see *Installing Modules*) or in a separate enclosure.

Wiring Connections

Power down the panel and connect the OctoRelay to the D8125X as shown in the table below.

D8129 Terminal	D8125X Terminal
GND	COMM
AUX	+12V OUT
DATA	OCTO DRIVE

Table 2: D8129 OctoRelay Connections

Power Output

Continuous Power

The D7112 produces 1.2A of power at 10.2 to 13.8 VDC for powered devices. Terminals 5, 7, and 27, and the expansion port (J2) share the available power. The **continuous** current draw for all powered devices connected to terminals 5 and 27, and the expansion port must be less than 1.2A.

Power restricted for Fire and Combined Fire/Burglary Systems: Include devices connected to terminal 7, Steady or Pulsed Alarm Power, when calculating power draw for fire and fire/burglary systems. Use maximum (in alarm) current draw so that the combined total reflects a worst case condition. Use at least one D8132 Battery Charger Module if your combined current draw for terminals 5, 7, and 27, the expansion port (J2), and terminal 7 exceeds 1.2A.

D8132 boosts power output: Adding a D8132 Battery Charger Module to the D7112 boosts power output to 2.4A. The D8132 also supports additional batteries of up to 30 Ah capacity if required. A second D8132 can be added to increase power output to 3.0A.

Caution: Current draw must never exceed 3.0A.

Auxiliary Power   Terminals   (5) **6**

The D7112 supplies up to 1.2A of power to terminal 5 for powering auxiliary devices. A self-resetting circuit breaker protects the circuit against shorts. Devices powered from this output must operate over a range of 10.2 to 13.8 VDC.

Auxiliary Power   Terminals   (27) **28**

The D7112 supplies up to 1.2A of power to terminal 27 for powering command centers. Do not connect other powered devices to terminal 27. A self-resetting circuit breaker protects the circuit against shorts.

Test for Total Continuous Current Draw

Connect all powered devices to terminal 5, command centers to terminal 27, and modules to the expansion port (J2).

Fire systems only: If you are testing a fire or fire/burglary system, connect devices to terminal 7 also. Test with devices in alarm to create a worst case condition.

Leave the battery disconnected. Connect the transformer to terminals 1 and 2, and plug it in. After one minute, if the connected devices exceed the available power, the green CPU LED goes out and the yellow battery LED flashes slowly (1 second on, 1 second off). The panel shuts down. Add one or more D8132 Battery Charger Modules or reduce the number of powered devices and test again.

Steady or Pulsed
Alarm Power Output

Terminals **6** (7)

The D7112 combines primary and secondary power to supply up to 2A of power to terminal 7 for steady or pulsed alarm power output for burglary systems.

Alarm Power restricted for Fire and Combined Fire/Burglary Systems: Calculate total current draw for all devices connected to terminals 5, 7, and 27, and the expansion port (J2) for fire and combined fire/burglary systems. Use maximum (in alarm) current draw so that the combined total reflects a worst case condition. The combined total cannot exceed 1.2A without connecting a D8132 Battery Charger Module to the D7112. See *D8132 Boosts Power Output* on the previous page.

Use alarm power for bells, siren drivers, piezo fire sounders, electronic horns, or other devices. Programming determines the format of the output and the conditions that activate it. A self-resetting circuit breaker protects the circuit against shorts. Devices powered from this output must operate over a range of 10.2 to 13.8 VDC.

Alarm Power Output Responses

Program the alarm output format in the *Bell Parameters* section of the program. See *Bell Parameters* in the *D7112 Program Entry Guide (74-06274-000)*. There are four annunciation patterns: Steady, Pulsed, California Standard, and Temporal Code 3.

Area bell relays follow the alarm power output: Area bell relays activate when there is power at the alarm power output. The annunciation formats programmed for the alarm power output appear at the area bell relay outputs.

Bell Noise Filter

Connect a Radionics D8123 Bell Noise Filter when connecting impulse bells (solenoid types) to the D7112 alarm power output, terminal 7. These bells may induce high noise levels into the D7112 power supply circuit. High noise levels can cause the D7112 to operate erratically. Install a bell noise filter at each bell, NOT at the panel. See Figure 5.

The D8123 filter uses the bell enclosure as a ground source. Verify that the enclosure is grounded.

TO D7112 ALARM POWER OUTPUT

WHITE WIRES (NO POLARITY)

GROUND SCREW

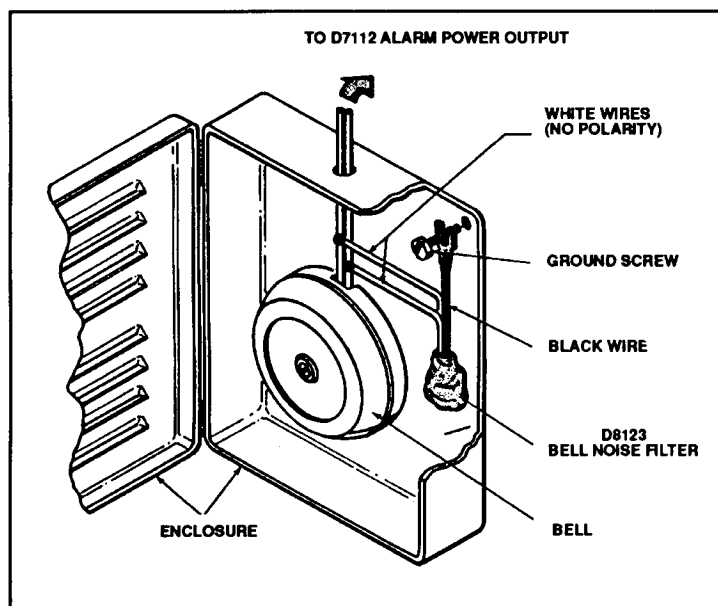BLACK WIRE

D8123 BELL NOISE FILTER

ENCLOSURE

BELL

Figure 5: Bell Noise Filter

Vibrating horns may induce noise: Some vibrating horns also induce high noise levels into the D7112 power supply circuit. The Radionics D8123 Bell Noise Filter can reduce noise levels for some of these horns. Test to be certain the filter reduces noise to an acceptable level.

Telephone Connections

Registration

The Radionics D7112 Control/Communicator panel is registered with the Federal Communication Commission under part 68, for connection to the public telephone system using an RJ31X jack installed by your local phone company.

FCC Registration Number: AJ9USA-65062-AL-E

Ringer Equivalence: 0.1A 0.2B

Notification

Do not connect registered equipment to party lines or coin-operated telephones. You must notify the local telephone company and supply them with the following information before connecting the panel to the telephone network.

• The particular line you are going to connect the panel to

• Make (Radionics), model (D7112), and serial number of the panel

• FCC registration number and ringer equivalence for the panel (see *Registration above*)

Location

To prevent jamming of signals, wire the RJ31X jack before the in-house phone system to support line seizure. Install the jack on the street side of the phone switch, wired ahead of any PBX equipment. Line seizure provides for a temporary interruption of normal phone usage while the communicator transmits data. After installation, confirm that the panel seizes the line, acquires dial tone, reports correctly to the receiver, and releases the phone line to the in-house phone system.
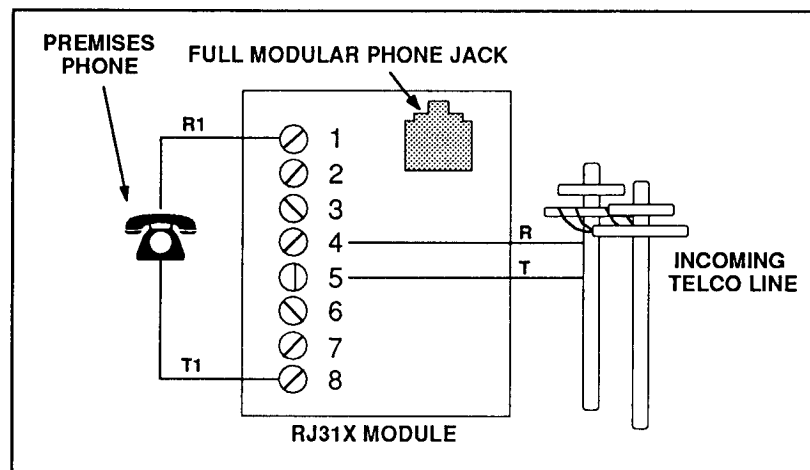

Figure 6: RJ31X Wiring

Phone Cord Connection

Connect one end of the D161 or D162 Telephone Cord to the D7112 TELCO Cord connector (J3, located on the bottom left corner of the D7112) and the other end to the RJ31X jack.

Phone LED (Red)

The red Phone LED indicates that communications are in progress. It lights when the panel seizes the phone line. It remains lit until the panel hangs up the phone line. See Figure 3 for the location of the LED.

CPU LED (Green)

The green LED indicates the status of the central processing unit (CPU). When the CPU is operating normally, the LED flashes 0.5 second on, 0.5 second off.

The green LED also serves as a ring indicator. When there is ring voltage on the phone line (the phone is ringing) the green LED flickers at a faster rate for the duration of each ring. See Figure 3 for the location of the LED.

Phone Line Monitor

The D7112 panel has a built-in phone line monitor that tests the phone line for voltage and current every 30 seconds. The normal voltage on a telephone line is approximately 48 VDC (24 VDC for some phone systems).

If the voltage on the line drops below 10 VDC, without a corresponding 10 to 15 mA current increase, the monitor senses trouble and starts a phone line trouble timer. The timer continues to run as long as the monitor senses trouble. It resets to zero when the line restores. If the timer reaches the delay time in the *Phone Supv Time* program item, it places the line in trouble. You can program the delay time for 2, 4, or 8 minutes. A blank entry disables phone line supervision. NFPA 72 allows a maximum delay time of four minutes. See *Phone* in the *D7112 Program Entry Guide (74-06274-000)*.

SERVICE PHONE appears in the display and the sounders at command centers activate when a phone line goes into trouble. You can also program the panel to transmit phone failure and restoral reports to the receiver. If you are using one phone line, when the line restores the D7112 transmits a phone failure report followed by a restoral report. If you are using the D728 Dual Phone Line Module and one line fails, the panel uses the good line to transmit the phone failure report at the time of the failure.

Bad line may test OK: The telephone line monitor uses voltage and current levels to test the status of the phone line. In some instances a given telephone line may be out of service without affecting the voltage on the line. The line sniffer can not recognize this trouble condition.

System Busy: Some command center functions are not available while the panel is communicating. SYSTEM BUSY appears in the command center's display if you attempt to use them while the panel is communicating.

Communication Failure

After six attempts to reach the receiver, the panel goes into communication failure. The panel clears any reports in its buffer. SERVC COMM FAIL appears in the display at command centers. After communication restores, enter a passcode to clear the display. If you program a phone number for Phone # 2, or program numbers for Phone # 2 and Phone # 3, the D7112 makes 10 attempts before it goes into communication failure. See the *D7112 Program Entry Guide* (74-06274-000) for programming instructions.

If programmed for Modem II format, the panel attempts to send a COMM RESTORAL report to the receiver once every hour after communications failure. No report is sent in the BFSK format.

DTMF Dialing

You can program the D7112 to use DTMF or pulse dialing. When it's using DTMF dialing and the dial tone doesn't go away after dialing three digits, the D7112 starts over using pulse dialing.

Ground Start

Some telephone systems require a momentary ground input to initiate dial tone. To interface with a ground start system, insert a plug-in relay (D136) into socket J10. See *Plug-In Relays*. If the D136 is inserted in the socket incorrectly the panel brings up dial tone, but is not able to communicate with the receiver. Place the Line Sniffer Select Jumper in the ground start position shown in Figure 7. Terminal 11 must be connected to an earth ground reference.

Ground start not for use in NFPA applications: You can not use ground start telephone systems for NFPA 71 Central Station Protective Signaling or NFPA 72 (Chap. 8) Remote Station applications.
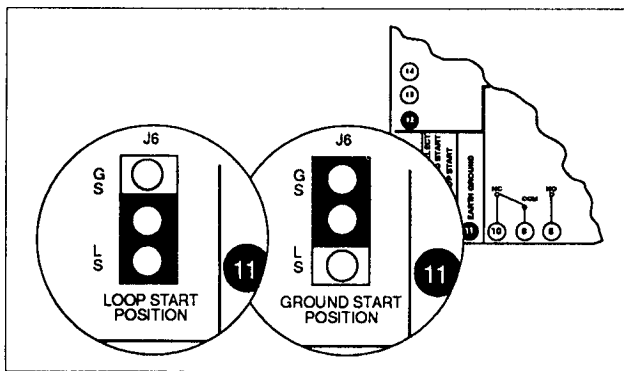

Figure 7: Line Sniffer Select Jumper

On-Board Points

Terminals

⑫ to ㉔

Description

The D7112 panel provides eight on-board points. Each point functions independently and does not interfere with the operation of the others. The panel monitors points for normal, shorted, or open conditions. Programming for the point determines how the panel responds to those conditions. See the *D7112 Program Entry Guide* (74-06274-000) for point programming options.

When wiring the on-board points, install a resistor at the far end of the sensor loop to provide a reference for supervision. You can connect dry contact sensing devices in series (normally closed) or in parallel (normally open) to any of these loops.

Point 1 is a powered sensor loop that you can use for two wire smoke or glass break detectors. Point 1 is terminated with a 1.8K Ω resistor. Points 2 to 8 are terminated with 1K Ω resistors.

Ground shunts cause missed alarms: The possibility of "ground shunts" increases significantly if you don't install the resistor at the end of the line. If you install the resistor for points 2 to 8 before a detection device on the sensor loop and the loop becomes grounded after the resistor, any devices beyond the ground are "ground shunted". Alarm or trouble conditions beyond the ground are not seen by the panel.
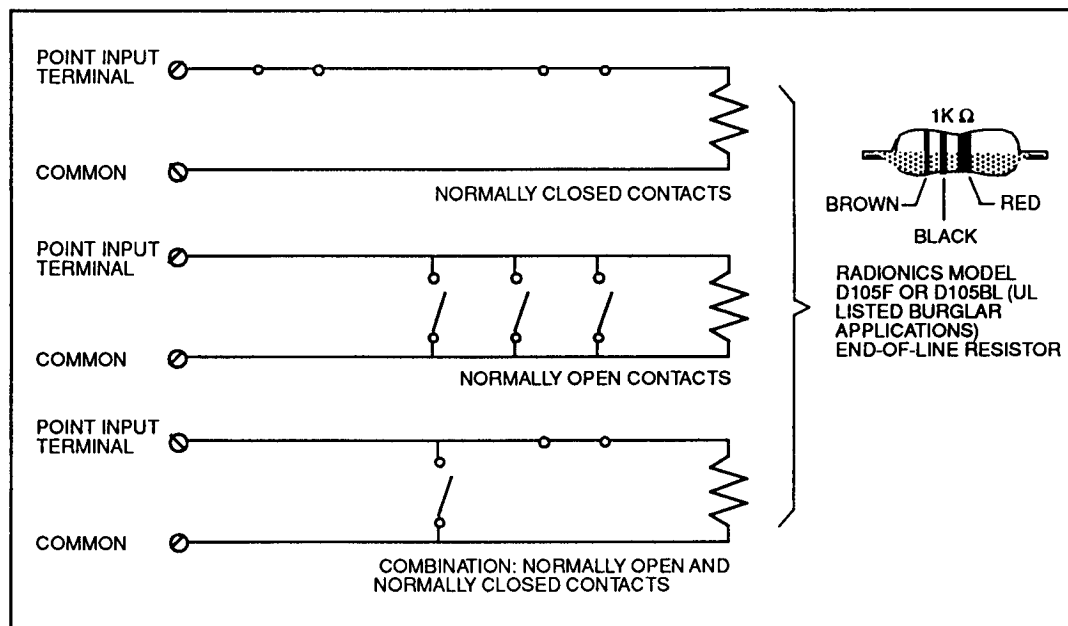

Figure 8: Point Sensor Loop Wiring

Point Parameters

Point 1, Powered Sensor Loop

Terminal 24 provides positive (+) voltage to detection devices (up to 19 mA idle, and 79 mA on a dead short). Terminal 23, the loop return (-), is isolated from earth ground. The power to this loop can be interrupted from a command center to reset smoke or glass break detectors. See the *D7112 Program Entry Guide* (74-06274-000) for the programming options available.

If either terminal makes contact with earth ground, terminal 11, or any common terminal on the panel, the loop does not operate properly. A trouble report for point 1 is transmitted if the point is programmed for troubles. A trouble report for point 1 is also transmitted if the panel battery voltage drops below 10.2 volts during an AC power loss. Point 1 is supervised with a 1.8K Ω end-of-line resistor (Radionics D104F), supplied with the panel.

Connection of Compatible Fire Detection Devices to Point 1

Two-Wire Smoke Detectors

Connect up to 10 two-wire smoke detectors to point 1. Refer to the Radionics Technogram, *Smoke Detectors Compatible with the D7112* (73-06116-000), for detector requirements.

Four-Wire Smoke Detectors

Connect any number (limited by available power) of 12 VDC four-wire smoke detectors to point 1. Install a suitable power supervision device according to the manufacturer's instructions. Route the power for the detectors through the on-board auxiliary relay or a D8129 OctoRelay to provide reset capability from command centers. Program a passcode to activate the relay. See *D7112 Program Entry Guide* (74-06274-000) for instructions.

Heat Detectors and Other Dry Contact Initiating Devices

Any number. Limited only by the authority having jurisdiction.

Burglar Devices

Connect any number (limited by available power) of burglar devices to point 1. Do NOT combine fire detection and burglar devices.

Points 2 to 8

For on-board points 2 to 8, the panel responds to normal, shorted, or open conditions between a point input terminal (13, 14, 16, 17, 19, 20, and 22) and any of the point common terminals (12, 15, 18, and 21).

You can determine the condition of on-board points 2 to 8 by measuring the voltage across the point input terminal and one of the common terminals. The sensor loops must be connected and the 1K Ω end of line resistor in place.

Normal Loop = Greater than 1.8 VDC, but less than 2.9 VDC.

Shorted Loop = Greater than 0 VDC, but less than 1.8 VDC.

Open Loop = Greater than 2.9 VDC, but less than 5 VDC.

Point Response Time

The D7112 Control/Communicator checks the point sensor loops every 150 milliseconds. A loop must be in an off normal (shorted or open) condition for two successive checks to be recognized as a faulted point. Point response time is rated between 150 and 300 milliseconds.

Off-Board Points

Description

You can use POPIT (Point of Protection Input Transponder) modules to provide up to forty off-board points, bringing the total number of points the D7112 can monitor to 48.

RF Transmitter Points

RF points require no wires between the point of protection and the panel. Installation time, cost, and effort are greatly reduced. RF Transmitters include the D7121 RF Door / Window Transmitter, the D7130 RF Motion Detector Transmitter, D7198 RF Heat Detector Transmitter, and the D7190 RF Smoke Detector Transmitter. You need to install the D7125 Receiver Interface at the panel to use RF points. The D7125 has mounting requirements that may affect your choice of mounting location for the D7112. See the *D7125 RF Receiver Interface Operation and Installation Manual* (74-06168-000) for a complete description of the RF system and installation instructions for the D7125 module and the RF Transmitters.

Wired POPIT Points

Wired off-board points connect to a POPEX (Point of Protection Expander) module. The POPEX module connects to the panel. You can run one two-wire backbone from point to point throughout the premises to connect all wired points on a single cable.

D8125X POPEX Module

Install the D8125X POPEX Module to use D8126 and D8127 POPITs and the D8129 OctoRelay. You can use the D8125X POPEX Module in conjunction with the D7125 RF Receiver Interface to combine RF and wired POPIT points. The total number of POPIT points can not exceed forty. See the *D8125X POPEX Operation and Installation Manual* (74-06178-000) for additional information and installation instructions.

Arming Devices

Description

Command centers, maintained or momentary contact keyswitches, or a combination of the two are used to arm and disarm areas. The D7112 panel may contain up to 4 areas. See the *Introduction* section for a description of areas.

The D7112 can supervise up to four command centers. The panel transmits a serial device trouble report, SDI FAILURE in the Modem II format or TROUBLE ZN D in the BFSK format, if it loses communication with a supervised command center. You can add additional command centers but they can not be supervised.

The number of supervised command centers, number of types of command centers, and number of areas you want to use determine the total number of command centers you can connect to the D7112. See *Command Center* in the *D7112 Program Entry Guide* (74-06274-000) for complete details on command center options.

Extra power needed for more than four command centers: Use a D8132 Battery Charger/ Power Supply Module if you connect more than four command centers to the D7112.

D1254 Command Center

The Radionics D1254 Alpha III Command Center is a 4-wire command center used to arm and disarm areas, annunciate complete system status, initiate system tests, and control many functions of the D7112 security system.

Programming
The DIP switches on the D1254 assign an address (1 to 4) to the command center. Addresses are then assigned to areas in the *Command Center Assignments* section of the program. Arm/disarm combinations, entry/exit delay times, and other D1254 parameters are also set in the program for the D7112.

Installation
Consult the *D1254 Installation Instructions* (74-06117-000) for installation and mounting instructions. Command centers connect to the D7112 panel in parallel as described in the table below. Terminals 25 and 26 carry the SDI (Serial Device Interface) data to command centers and other serial devices. It is important to connect devices to these terminals correctly. See the *Security System Owner's Manual* (71-06141-000) for operational information.

(handwritten note in margin: is not shorted. is not shorted out if Aux pwr is out if)

D7112		Command Center	
Terminal	**Function**	**Wire Color**	**Function**
25	SDI BUS B	Green	Data-Out
26	SDI BUS A	Yellow	Data-In
27	AUX POWER + (12VDC)	Red	12 VDC
28	COMMON -	Black	Common

Table 3: D1254 Command Center Connections

D710 Handheld RF Command Center

The D710 Handheld RF Command Center is a small, lightweight, wireless, command center you can carry in a pocket or purse. You can use the D710 for arming and other basic system functions. You must install the D7125 Receiver and Interface Module to use the D710 command center. See the *D710 Handheld RF Command Center Operation and Installation Manual* (74-06265-000) for a detailed description and installation instructions.

Keyswitch Connector (J1)

You can connect a maintained or momentary contact arming station (keyswitch) to four pin connector J1 to master arm and disarm area 1. Connector J1 is at the top left corner of the circuit board. Two powered LED outputs are available to show area arming status and the summary loop status of the points. You can assign both command centers and the keyswitch to Area 1.

Programming

To use the J1 keyswitch connector, assign it to point 9 in area 1. Use a loop code beginning with 4 or 5. See *Point Assignments* in the *D7112 Program Entry Guide* (74-06122-000).

Installation

A 4-wire flying lead with a plug connector at one end (15-06169-000) connects the keyswitch to connector J1 on the D7112. Wire the keyswitch as shown in the table below. For maintained switches, connect a 1K Ω resistor to the yellow and black wires (pins 1 and 3 on J1) at the keyswitch so that the switch opens the circuit when it operates. A short on the circuit produces an alarm if the area is armed and a trouble if it is disarmed.

For momentary switches, connect a 1K Ω resistor to the yellow and black wires (pins 1 and 3 on J1) at the keyswitch so that the switch shorts the resistor when it operates. An open on the circuit produces an alarm if the area is armed and a trouble if it is disarmed.

PIN # (Connector J1 on D7112, pins numbered left to right)	Flying Lead Wire Color	Function
1	Black	Common (-)
2	Green	Summary Point Status LED Output +5 VDC at 22 mA maximum
3	Yellow	Arming Circuit (use 1K Ω end-of-line resistor)
4	Red	Arming Status LED Output +5 VDC at 22 mA maximum

Table 4: Keyswitch Connection to J1

Other Keyswitch Connection Options

You can program any point in any area as a keyswitch connection point. However the powered LED outputs at J1 are only available for point 9 and area 1. If you use another point for a keyswitch connection use D8129 OctoRelays to switch auxiliary power for LED outputs.

For maintained switches, connect the end-of-line resistor for the point at the keyswitch so that the switch opens the circuit when it operates. A short on the circuit produces an alarm if the area is armed and a trouble if it is disarmed.

For momentary switches, connect the end-of-line resistor for the point at the keyswitch so that the switch shorts the resistor when it operates. An open on the circuit produces an alarm if the area is armed and a trouble if it is disarmed.

Keyswitch Operation

Maintained Contact

If you program the point the keyswitch is connected to for a maintained contact, an open on the arming circuit arms the area. Returning the circuit to normal disarms the area. Faulted points are force armed. See *Point Assignments* in the *D7112 Program Entry Guide* (74-06122-000).

Momentary Contact

If you program the point the keyswitch is connected to for a momentary contact, shorting the arming circuit toggles the area's arming state between armed and disarmed. Faulted points are force armed. See *Point Assignments* in the *D7112 Program Entry Guide* (74-06122-000).

Silencing the Bell

To silence the bell (stop output at terminal 7 or deactivate area bell relay) if the system is armed, operate the keyswitch to disarm the area.

If the area is disarmed, operate the keyswitch once to start the arming process. Operate it a second time to silence the bell and stop the arming process.

D268/D269 Independent Zone Control
D279 Independent Zone Control

You can program any on-board point so that the D268/D269 or D279 Independent Zone Control operates as independent point control (arms and disarms the point).

See the *Point Assignments* in the *D7112 Program Entry Guide* (74-06274-000) for programming information. See the *D268/D269 Operation and Installation Instructions* (74-04758-000) or the *D279 Operation and Installation Instructions* (74-04993-000) for wiring and operation instructions.

Programmer and Accessory Connections

Programmer Connector (J4)

Connect the Radionics D5200 Programmer to the D7112 programmer connector (J4). The connector is on the top left corner of the D7112 board (see Figure 4). Refer to the *D5200 Programmer Operation Manual* (74-06176-000) for information on using the D5200.

1. Plug the D5200 Data/Power cord into the D7112 programmer connector.
2. Advance the D5200 display to the D7112 handler. (See the *D5200 Programmer Operation Manual*).
3. Perform the desired programming function (send or receive program).

Expansion Port Connector (J2)

Expansion Port Connector (J2) is on the upper left corner of the I/O board. See Figure 3. Modules such as the D728 Dual Phone Line Module, the D8125X POPEX Module, and the D7125 RF Receiver Interface all connect to this port. Modules link together as shown in Figure 9. The D7125 must always be last on the chain.
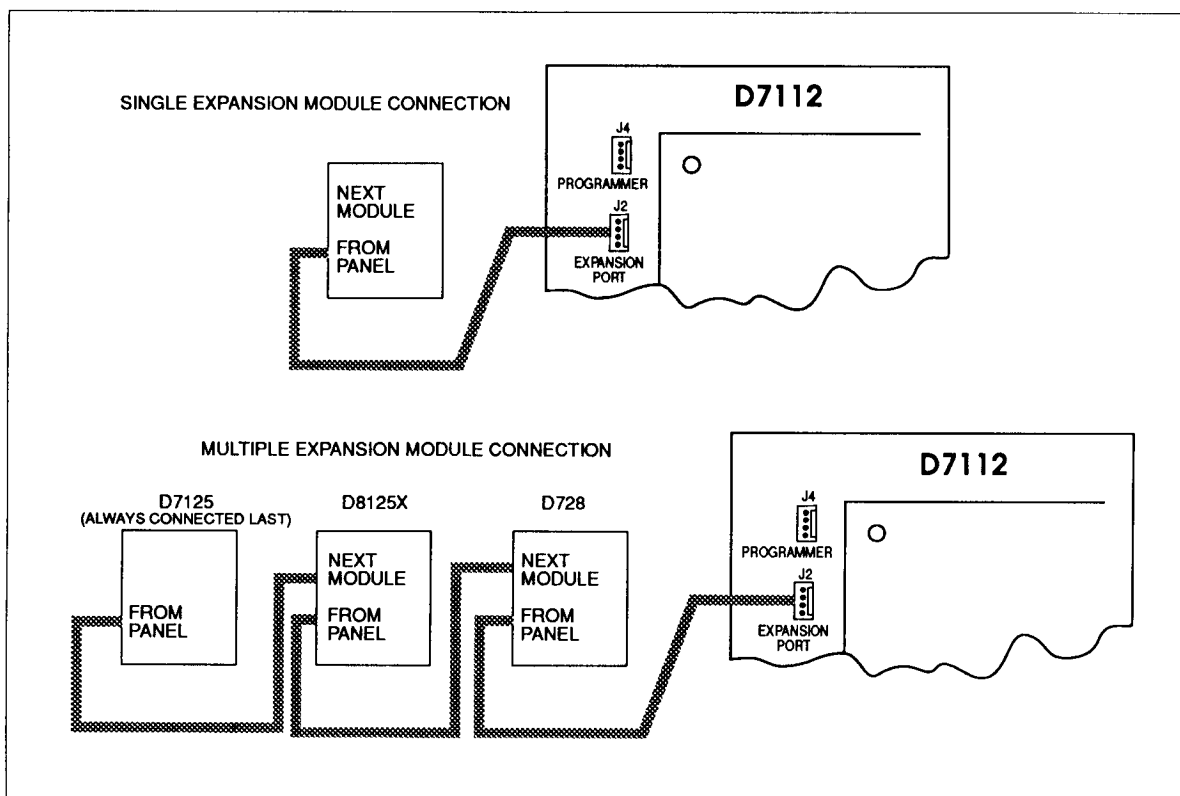

Figure 9: Typical Expansion Module Connections

Installation Guide For UL and Fire Applications

Listings and Approvals Pending

Introduction

The *D7112 System Chart* references components evaluated and listed by Underwriters' Laboratories for compatibility with the D7112 Control/Communicator. These components meet the basic system requirements for the applicable standard.

The *D7112 System Wiring Diagram*, following this section, shows the relationship between the D7112 panel and the accessory components referred to in the *D7112 System Chart*. For more detailed instructions on the installation and operation of these components, see the installation document listed for the component on the chart.

Optional Compatible Equipment

You can use UL listed components which do not require evaluation for electrical compatibility in many applications when installed according to the manufacturer's instructions.

Burglary Applications

You can use UL listed burglary alarm sensors which do not require evaluation for electrical compatibility in burglary applications. In some cases you must use a UL listed Radionics interface in conjunction with the sensors. Consult the individual component specification and installation documents to determine suitability.

Fire Applications

You can use UL listed fire initiating devices not requiring electrical compatibility evaluation in any application. For example: 4-wire smoke detectors, heat detectors, waterflow switches, and manual pull stations are suitable fire initiating devices. Consult the individual component specification and installation documents to determine suitability.

Two-wire smoke detectors only connect to on-board point 1. Two-wire detectors must be evaluated for electrical compatibility, and must be UL listed for use with the D7112. See the Radionics Technogram *Smoke Detectors Compatible with the D7112* (73-06116-000), or you may contact the detector manufacturer.

When using 4-wire smoke detectors, install a suitable power supervision unit according to the manufacturer's instructions. Use the D8129 OctoRelay to provide reset capability. See the *Relays* section for details on installation of the D8129.

UL listings restrict the total power output for the system during alarm conditions to 1200 mA, unless a D8132 Battery Charger Module is connected to the D7112. See Column C of the *D7112 Communicator Standby Battery and Current Rating Chart*.

Enclosures

Radionics offers three optional enclosures for the D7112 circuit board. Each of the enclosures requires the mounting skirt included with the D7112M package.

The **D8103** enclosure is suitable for residential fire and/or burglary installations and commercial applications that do not require attack resistance or approval by Factory Mutual. (See the *D7112 System Chart* for acceptable applications.)

Enclosures (Continued)

The **D8108A** is attack resistant. It is intended primarily for UL Certificated Central Station, Local, and Police Connected burglar alarm applications. You can use the D8108A in any burglar or fire alarm application where the D8103 or D8109 enclosure is suitable. UL lists the D8108A for NFPA 71 Central Station, NFPA 72 (Chap. 6) Local, NFPA 72 (Chap. 8) Remote Station, and NFPA 74 Household Fire Warning systems. The D8108A is approved by Factory Mutual, California State Fire Marshal, and the New York City Board of Standards and Appeals.

The **D8109** is intended for commercial fire alarm applications, but it may also be used in residential applications. UL lists the D8109 for NFPA 71 Central Station, NFPA 72 (Chap. 6) Local, NFPA 72 (Chap. 8) Remote Station, and NFPA 74 Household Fire Warning systems. The D8109 is approved by Factory Mutual, California State Fire Marshal, and the New York City Board of Standards and Appeals.

Battery Standby Calculations for Fire Alarm Applications

See the *D7112 Standby Battery and Current Rating Chart* for totals B and C used in the formulas below. Do not install more than one battery in the D7103 enclosure. If your application requires more than one battery, use an appropriate optional enclosure. See *Enclosures* above. When connecting two batteries, use either the D122 Dual Battery Wiring Harness or the D8132 Battery Charger Module.

NFPA 71 Central Station Systems

Central Station (NFPA 71) Systems require 24 hours of standby battery capacity. If two batteries are required to meet the basic standby requirements for an NFPA 71 installation, the D8109 enclosure must be used for the D7112. To verify compliance with NFPA 71 you only need to add the current values listed in column B (AC Power Off) and confirm that this total does not exceed 225 mA (one battery) or 450 mA (two batteries).

An alternate means of verifying compliance with standby battery requirements for NFPA 71 systems is to use the formula shown below to determine the ampere hour (Ah) requirements of the system as related to the ampere hour capacity of the batteries. Note that the formula includes a 10% contingency factor. This factor makes allowance for depletion of battery capacity with age.

NFPA 71 Ampere-Hour Calculation Formula

Total B		Hours		Contingency		Total Ah
(_____	x	24)	+	10%	=	_____

Total Ah requirements must not exceed Ah capacity of batteries:

One D126 Battery = 7 Ah

Two D126 Batteries = 14 Ah

NFPA 72 (Chap. 6) Local Systems

NFPA 72 (Chap. 6) Local Systems require 24 hours of standby plus 5 minutes of alarm operation at the end of the 24 hour period. You must install two batteries to meet the basic standby requirements for an NFPA 72 (Chap. 6) installation. You must use battery ampere hour (Ah) calculations to verify compliance with NFPA 72 (Chap. 6). The following formula includes the calculation for 5 minutes of alarm operation at the end of the 24 hour period, as well as a 10% contingency factor which allows for depletion of battery capacity with age.

Battery Standby Calculations for Fire Alarm Applications (Continued)

NFPA 72 (Chap. 6) Ampere-Hour Calculation Formula

Total B	Hours		Total C	Hours	Contingency	Total Ah
(_____	x 24) +	(	_____	x .083) +	10%	= _____

Total Ah requirements must not exceed Ah capacity of batteries:

Two D126 Batteries = 14 Ah

NFPA 72 (Chap. 8) Remote Station Systems

NFPA 72 (Chap. 8) Remote Station Systems require 60 hours of standby plus 5 minutes of alarm operation at the end of the 60 hour period. A D8132 Battery Charger Module with additional batteries installed in a separate D8109 or D8108A enclosure may be required in the D7112 system to meet the basic standby requirements for an NFPA 72 (Chap. 8) installation. You must use battery ampere hour (Ah) calculations to verify compliance with NFPA 72 (Chap. 8). The following formula includes the calculation for 5 minutes of alarm operation at the end of the 60 hour period, as well as a 10% contingency factor which allows for depletion of battery capacity with age.

NFPA 72 (Chap. 8) Ampere-Hour Calculation Formula

Total B	Hours		Total C	Hours	Contingency	Total Ah
(_____	x 60) +	(	_____	x .083) +	10%	= _____

Total Ah requirements must not exceed Ah capacity of batteries:

Two D126 Batteries = 14 Ah

NFPA 74 Household Fire Warning Equipment

The NFPA 74 Household Fire Warning Equipment Standard recommends 24 hours of standby plus 4 minutes of alarm operation at the end of the 24 hour period. You must use battery ampere hour (Ah) calculations to verify compliance with NFPA 74. The following formula includes the calculation for 4 minutes of alarm operation at the end of the 24 hour period, as well as a 10% contingency factor which allows for depletion of battery capacity with age.

NFPA 74 Ampere-Hour Calculation Formula

Total B	Hours		Total C	Hours	Contingency	Total Ah
(_____	x 24) +	(	_____	x .067) +	10%	= _____

Total Ah requirements must not exceed Ah capacity of batteries:

Two D126 Batteries = 14 Ah

D7112 UL System Chart

Radionics D7112 UL System Chart

A D7112 Control/Communicator is required in all applications listed on this chart. The D8004 Transformer Enclosure may be required by the local Authority Having Jurisdiction.

Application:	NFPA Standard	Min. Bat. Standby Hours (1)	Enclosure	D1254 Command Center	D710 Command Center	D125A	D129	Zonex D8125X D8126 D8127	Smoke Detectors 2-wire (2)	Smoke Detectors 4-wire Any Model	Reversing Relay D127	Dual Phone Line D728	Bell Cir. Supervision D192A	Ind. Zone Control D268/D269	Miscellaneous Equipment Requirements
Household Burglary	--	4	D7103 or D8103 or D8109 or D8108A	Choice Required	Choice Required	OP	NA	OP	NA	NA	SP	SP	SP	OP	85 dBA Listed Audible Device(s)
Household Fire	74	24 hrs + 4 minute alarm		Choice Required	Choice Required	Choice Required		Choice Required	Choice Required	Choice Required	NA	SP	SP	NA	85 dBA Listed Audible Device(s)
Household Fire/Burg. Combination	74	24 hrs + 4 minute alarm		Choice Required	Choice Required	Choice Required		Choice Required	Choice Required	Choice Required	SP	SP	SP	NA Fire	85 dBA Listed Audible Device(s)
Central Station Burglary (Grade C)	--	4		Choice Required	OP	OP	NA	OP	NA	NA	SP	SP	SP	OP	For Grade B: D8108A & Listed Bell Housing
Central Station Fire	71	24		OP	OP	Choice Required		Choice Required	OP	OP	NA	R	SP	NA Fire	
Comb. Local & Central Sta. Fire	72 & 71	24 hrs + 5 minute alarm	D8109	R	OP	Choice Required		Choice Required	OP	OP	NA	R	R	NA Fire	Listed Audible Device(s)
Central Station Fire/Burg. Comb.	71	24		OP	OP	Choice Required		Choice Required	OP	OP	SP	R	SP	NA Fire	
Comb. Local & Central Sta. Fire/Burg.	72 & 71	24 hrs + 5 minute alarm	or	R	OP	Choice Required		Choice Required	OP	OP	SP	R	R	NA Fire	Listed Audible Device(s)
Local Fire	72	24 hrs + 5 minute alarm		R	OP	Choice Required		Choice Required	OP	OP	NA	R	R	NA Fire	Listed Audible Device(s)
Electrically Actuated Transmitter	71	24	D8108A	OP	OP	SP	SP	SP	NA	NA	NA	R	NA	NA Fire	
Remote Station Fire	72	60 hrs + 5 minute alarm		R	OP	Choice Required		Choice Required	OP	OP	NA	R	SP	NA	D8132 Module May Be Required
Local Fire & Burg. Combination	72	24 hrs + 5 minute alarm	D8108A	OP	OP	Choice Required		Choice Required	OP	OP	SP	R	R	OP	Listed Audible Device(s) Listed Bell Housing
Police Connected Burglary	--	4	D8108A	Choice Required	Choice Required	OP	NA	OP	NA	NA	OP	SP	SP	OP	Listed Audible Device(s) Listed Bell Housing
Local Burglary	--	4	D8108A	Choice Required	Choice Required	OP	NA	OP	NA	NA	SP	SP	SP	OP	Listed Audible Device(s) Listed Bell Housing
Part Number			See wiring / installation document number listed for instructions	74-06117-000	74-06265-000	74-05955-000	74-031158-000	Zonex Systems See Note (3) for Zonex Systems	Manufacturer Instructions	Manufacturer Instructions	74-03146-000	74-06122-000	74-0551S-000	74-04758-000	

Optional Modules (Suitable for use in all applications)

D8129 OctoRelay Module (74-04562-000)
D8130 Release Module (74-04739-000)
D8132 Battery Charger Module (74-04777-000)
D9131 Printer Interface Module (74-04790-000)

LEGEND

R - Required
OP - Optional
NA - Not Acceptable in System
NA Fire - Not Acceptable for Fire Zones
SP - Special Applications (Not Normally required in this application)

Note: This chart references components which have been evaluated and listed by UL for electrical compatibility.

(1) Battery requirements for standby power can be determined from the Battery Chart in this manual.

(2) Two-wire smoke detector devices must be evaluated for electrical compatibility with the D7112, and must be U.L. listed for use with the D7112. See UL Smoke Detector Compatibility Technogram (73-061143-000).

(3) ZONEX Systems - D8125X, D8126 U/T, and D8127 U/T only suitable for use with 4-wire smoke detectors (74-06178-000).

D7112 System Wiring Diagram

D8129

GND
AUX
DATA

UP TO FORTY
D8126 U/T OR
D8127 U/T POPITS

UP TO
FORTY RF
POPITS

D7125

D8125X
COM
+12V OUT
OCTO DRIVE
+   -

TO RJ31X FOR
PRIMARY
PHONE LINE

TO RJ31X FOR
SECONDARY
PHONE LINE

MAXIMUM OF TEN 2-WIRE
SMOKE DETECTORS, UL
LISTED AS COMPATIBLE
WITH THE D7112. SEE
TECHNOGRAM
73-06116-000.

ARMING STATION

D1254
UP TO FOUR
SUPERVISED

EOL DEVICE 1.8K W D104

SUITABLE FOR VALVE TAMPER AND OTHER TYPES
OF EXTINGUISHING SYSTEM SUPERVISION.

D105 FL
EOL DEVICE

TYPICAL
INITIATING
DEVICES ARE
DOOR
CONTACTS
NO/NC, FLOOR
MATS, MOTION
SENSORS,
GLASS BREAK
DETECTORS,
ETC.

D105 BL EOL
(FOR TYPICAL
BURGLAR ALARM
APPLICATIONS)

NO
NC

J4
J1 KEY SWITCH

CPU   PHONE   BATTERY

PROGRAMMER

J2

RADIONICS D7112

EXPANSION
PORT

28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12

J4
C
S
L
S

J3

11 10 9 8 7 6 5 4 3 2 1

17-05622-000

MAY REQUIRE D8004
ENCLOSURE

D728

3 4or5 2

10   1

D125A

6 8 7 9

D192A

ALARM   COM
TRIG
SUPV   AUX
IN   PWR
IN

ALRM CKT

D1640
TRANSFORMER
16 VAC
40 VA
60 HZ

LISTED
AUDIBLE
SIGNALING
DEVICES
RATED AT 10.2
TO 13.8 VDC
(DO NOT USE
VIBRATING
TYPE HORNS)

AS
REQUIRED

D126
BATTERY
12V 7Ah

D126
BATTERY
12V 7Ah

D122 DUAL
BATTERY
HARNESS

LOOP B

1 5 8 9 7

2   6

3 D129

4

10 11 12 13

L
O
O
P

A

D129 PROVIDES OPTIONAL
WATERFLOW ALARM RETARD
FEATURE. NOT SUITABLE FOR
2-WIRE SMOKE DETECTORS.
NOTE: USE ZERO RETARD EXCEPT
FOR WATERFLOW.

ECL DEVICE 15-03130-001

D7112 Standby Battery and Current Rating Chart

Accessories

All currents are in milliamperes (1 ampere=1000 milliamperes).

Model Number	Number Used	AC Power On Normal Current		AC Power Off Minimum Current		In Alarm Maximum Current	
		Each Unit	Total	Each Unit	Total	Each Unit	Total
D7112	____	130 x Quan.= ____		130 x Quan.= ____		165 x Quan.= ____	
D125A	____	20 X Quan.= ____		19 x Quan.= ____		123 x Quan.= ____	
D127	____	13 x Quan.= ____		12 x Quan.= ____		45 x Quan.= ____	
D728	____	14 x Quan.= ____		14 x Quan.= ____		45 x Quan.= ____	
D129	____	25 x Quan.= ____		25 x Quan.= ____		26 x Quan.= ____	
D192A	____	15 x Quan.= ____		26 x Quan.= ____		50 x Quan.= ____	
D1254	____	104 x Quan.= ____		106 x Quan.= ____		206 x Quan.= ____	
D8125X	____	48 x Quan.= ____		47 x Quan.= ____		48 x Quan.= ____	
D8126	____	3 x Quan.= ____		3 x Quan.= ____		4 x Quan.= ____	
D8127	____	3 x Quan.= ____		3 x Quan.= ____		4 x Quan.= ____	
D8129	____	5 x Quan.= ____		5 x Quan.= ____		5 x Quan. + 25 x # relays = ____	
D8130	____	5 x Quan.= ____		5 x Quan.= ____		54 x Quan.= ____	
D9131	____	24 x Quan.= ____		22 x Quan.= ____		36 x Quan.= ____	
M801,2,3	____	0 x Quan.= ____		0 x Quan.= ____		60 x Quan.= ____	
M806	____	0 x Quan.= ____		0 x Quan.= ____		100 x Quan.= ____	

Ratings of other devices in the system which are not shown above:

____	____	____ x Quan.= ____		____ x Quan.= ____		____ x Quan.= ____	
____	____	____ x Quan.= ____		____ x Quan.= ____		____ x Quan.= ____	
____	____	____ x Quan.= ____		____ x Quan.= ____		____ x Quan.= ____	
____	____	____ x Quan.= ____		____ x Quan.= ____		____ x Quan.= ____	

Total A = ____   **Total B =** ____   **Total C* =** ____

*If Total C exceeds 1500 mA, a D8132 is required to provide an additional 1200 mA. In all cases the total of each column above must not exceed the limit for the system classes that follow.

Household Burglary

		Total A	Total B	Total C
4 Hour Standby:	One Battery	Limit = 1000	Limit = 1000	Limit = 1000
	Two Batteries	Limit = 1000	Limit = 1000	Limit = 2000

Commercial Burglary

4 Hour Standby:	One Battery	Limit = 1000	Limit = 1000	Limit = 1000
	Two Batteries	Limit = 1000	Limit = 1000	Limit = 2000

NFPA 71 Central Station Signaling Systems

24 Hour Standby:	One Battery	Limit = 1000	Limit = 225	Limit = 1500*
	Two Batteries	Limit = 1000	Limit = 450	Limit = 1500*

* Without D8132

NFPA 72 (Chap. 6) Local Protective Signaling Systems (Fire)

24 Hour Standby Plus 5 Minutes of Alarm Operation. See *NFPA 72 (Chap. 6) Ampere-Hour Calculation Formula.*

NFPA 72 (Chap. 8) Remote Station Fire Systems (Fire)

60 Hour Standby Plus 5 Minutes of Alarm Operation. See *NFPA 72 (Chap. 8) Ampere-Hour Calculation Formula.*

NFPA 74 Household Fire Warning Equipment

24 Hour Standby Plus 4 Minutes of Alarm Operation. See *NFPA 74 Ampere Hour Calculation Formula.*

Quick Reference Terminal Description

Terminal	Function	Description
1, 2	AC Input	These terminals are the source of primary power. Requires 16.5 VAC, 40 VA transformer.
3 (+)	Battery Positive (+)	Connect 12V, 7Ah rechargeable lead acid type battery's positive terminal (+) to terminal 3.
4 (-)	Battery Negative (-)	Connect 12V, 7Ah rechargeable lead acid type battery's negative terminal (-) to terminal 4.
5 (+)	Auxiliary (AUX) Power	Supplies 1 Amp at 10.2 to 13.8 VDC to auxiliary devices. Use terminal 6 for common.
6 (-)	Power Common	Terminal 6 is common for Auxiliary Power (terminal 5) and Alarm Power (terminal 7).
7 (+)	Steady or Pulsed Alarm Power Output	Supplies 2 Amps at 10.2 to 13.8 VDC for steady or pulsed alarm output. Use terminal 6 for common.
8, 9, 10	Auxiliary Relay	On-board programmable relay. Terminal 8 is open when the relay is not activated. Terminal 9 is common. Terminal 10 is closed when the relay is not activated. **D136 Plug-in Relay required:** Install a D136 in socket J7 to use auxiliary relay. Output is dependent on programming.
11	Earth Ground	Connect to earth ground. A cold water pipe or grounding rod is preferred. Do not connect to telephone or electrical ground.
13, 14, 16, 17, 19, 20, 22	On-Board Point Inputs	Connect normally open and/or normally closed detection devices to loop wiring. 1 kΩ resistor required at end of loop.
12, 15, 18, 21	Point Commons	Loop returns for on-board points.
23 (-), 24 (+)	Powered Loop	Use terminals 23 and 24 for 2-wire smoke or glass break detectors. 1.8kΩ end of line resistor required at end of loop.
25 26	SDI BUS B SDI BUS A	Terminals 25 and 26 are used as a two wire bus to drive the command centers, printer interface and other SDI devices.
27 (+) 28 (-)	SDI Power Output SDI Power Common	Power for command centers, printer interface and other SDI devices. This separate protected power output for SDI devices is not affected by shorts on any other terminal.

Troubleshooting Guide

Introduction

Radionics provides this guide to help you troubleshoot problems with the D7112. To prevent problems from occurring, read the preceding sections of this manual and the program entry guide to verify that the panel is correctly installed and programmed.

Phone Line Trouble

Phone line problems that are not corrected can result in the D7112 going into Communications Failure. You can program the D7112 to monitor one or two phone lines. See the *D7112 Program Entry Guide* (74-06274-000) for programming instructions.

If you enable the phone line monitor, SERVICE PHONE appears in the command center's display when the D7112 detects a problem on the phone line.

Symptom	Diagnosis	Remedy
SERVICE PHONE appears in command center display.	D7112's phone line monitor detects a phone line as faulted.	1. Verify that the telephone cord is correctly connected to the RJ31X and the D7112. 2. Verify that the RJ31X jack is wired correctly. The incoming phone line must be wired to terminals 4 and 5. The in house phone system must be wired to terminals 1 and 8. 3. Verify that all telephones are on-hook. Leaving a telephone on hold after the other party hangs up creates an off-hook condition. Verify that no phones are on hold. If completing the steps above does not restore the phone line, meter the phone lines first for voltage and then current. You should meter at least 20 VDC when the D7112 is idle (on-hook). If the voltage is below 20 VDC, meter for current. There should be at least 10 mA of current on the line. If your readings are below the minimum values, contact your telephone company repair service.

Communications Failure

The D7112 goes into Communications Failure after six unsuccessful attempts to reach the receiver (ten attempts if two or more phone numbers are programmed). Follow the *Phone Line Trouble* procedure to verify that there is no problem with the phone lines at the D7112 installation. If the phone lines are good, monitor the lines (preferably at the receiver) for the symptoms listed below.

Symptom	Diagnosis	Remedy
The line rings but the receiver does not pick up. RING indicator on line card does not light. Can not hear ring with headset at receiver location.	Line is not ringing at the receiver.	1. Verify that the lines are correctly connected to the receiver. 2. Verify that correct prefixes and phone numbers for the receiver have been programmed into the D7112. If completing the steps above does not correct the problem, contact your telephone company repair service.
The line rings but the receiver does not pick up. RING indicator on line card lights. Can hear ring with headset at receiver location.	Line card in receiver may be faulty.	Review receiver manuals for trouble shooting procedures.
The D7112 reaches a busy signal for all ten attempts to reach the receiver.	Calls are not reaching the receiver.	1. Verify that correct prefixes and phone numbers for the receiver have been programmed into the D7112. 2. Verify that the phone lines are not shorted between the phone company's equipment and the receiver by placing a call to the number for the receiver. If you hear the line ring, but the ring detector doesn't light, or if you hear a busy signal and the green on line (OL) indicator is not lit, call the phone company for service.
	The receiver's call load is too great.	Additional line cards and phone lines may be needed for the receiver.
The receiver answers the call and provides an acknowledgment tone, but the communicator does not transmit reports.	The receiver is not producing the correct acknowledgement tone.	Verify that the receiver is producing a 2300 Hz or Modem II acknowledgment tone.
	The D136 relay in J10 for ground start phone systems is inserted incorrectly.	Insert the D136 relay in socket J10 correctly. See the *Relays* section of this manual for instructions.

Communications Failure (Continued)

Symptom	Diagnosis	Remedy
The receiver answers the call and provides an initial "handshake" acknowledgment, but does not acknowledge the D7112's report transmission with a "kiss-off" acknowledgment .	The receiver is not compatible with the D7112's transmission format.	Verify that the receiver is compatible with the format the D7112 is using (either BFSK or Modem II). See *Phone* in the *D7112 Program Entry Guide* (74-06274-000).
	Noisy phone lines are interfering with report transmission.	Try making a voice call to the receiver on the line to verify the noisy condition. It may be necessary to have the phone company check the lines.

Problems Programming the Panel

Before attempting to program the D7112, you should be familiar with the basic operation of the D5200 programmer. See the *D5200 Operation Manual* (74-06176-000). If you still experience problems, check for the symptoms below.

Symptom	Diagnosis	Remedy
The programmer displays PLUG IN 7112 when you press SEND or RECV.	The programmer is not correctly connected to the D7112.	1. Verify that the data/power cord is plugged into the COMMUNICATOR port on the D5200. 2. Verify that the data/power cord is plugged securely into the D5106 programmer interface. 3. Verify that the D5106 programmer interface is plugged securely into connector J4 on the D7112. 4. Check each conductor in the data/power cord and the D5106 programmer interface for continuity. Plug the cord into the interface and check from end to end.

Problems with Points

Symptom	Diagnosis	Remedy
Point 1 (powered sensor loop) remains in trouble or alarm with all detection devices normal.	The sensor loop is open, shorted, or grounded. Opens or shorts cause troubles or alarms depending on point programming.	Remove the loops from the D7112 and meter them for continuity. There should be no more than 100 Ω, plus 1.8K Ω for the end of line resistor, of resistance between the wires that connect to terminals 23 and 24. If there is less than 1.8K Ω of resistance, check the wiring for shorts or grounds.
	A ground on the loop can cause a trouble report.	With the wires for the circuit loops still removed from the D7112, meter them for continuity to ground.
One or more points (2 to 48) remain in trouble or alarm with all devices connected to the sensor loops normal.	The sensor loop is open, shorted, or grounded. Opens, shorts, or grounds cause troubles or alarms depending on point programming.	Remove the sensor loop from the D7112, POPIT, or RF Transmitter and meter it for continuity. There should be no more than 100Ω resistance, plus the value of the end of line resistor on the wires. If you meter less resistance than the value of the end of line resistor, check the wiring for shorts. Note: RF Transmitters do not use end of line resistors. With the wires for the loop removed, meter them for continuity to ground. A ground before the end of line resistor on a on-board point's sensor loop is interpreted as a short. A ground on a sensor loop for a POPIT or RF point is interpreted as an open.
Off-board points are sending erroneous reports and displaying as shorted at the command centers. Relays are erratic.	Data lines to the points are reversed on the ZONEX module.	Correctly connect the reversed data lines on the ZONEX module.
Erroneous trouble and restoral reports for point 1	Command 47 is enabled for areas other than the area point 1 is assigned to. Off-board relays are not being used for sensor reset.	If you are not using off-board area relays set for sensor reset, only enable Command 47 (sensor reset) for the area with point 1 assigned to it. If other areas have Command 47 enabled, pressing Command 47 from those areas generates troubles and restorals for point 1.
Faulted points do not generate alarms or troubles as programmed.	Command 47 pressed at a command center at the time the alarm or trouble was generated.	The D7112 ignores input from all other points in the same area during sensor reset (Command 47).
	Two points are programmed with the same address.	Points programmed with the same address do not function correctly. Check to be certain that you have not duplicated point addresses.

Problems with Command Centers

Symptom	Diagnosis	Remedy
Command Centers show erratic behavior. For example, the pip that confirms you pressed a key "echoes" or the back lighting flashes off and on.	A supervised address has been entered in more than one command center.	Entering a supervised address in more than one command center causes erratic behavior. Use a supervised address in one command center only.

Battery and Power Reports

You can program the D7112 to transmit both battery and AC power status reports. See the *D7112 Program Entry Guide* (74-06274-000). If battery or AC power reports are a problem check the following.

1. Verify that there is at least 16.5 VAC on terminals 1 and 2.

2. The outlet the transformer is plugged into should meter between 110 and 120 VAC.

3. Verify that the output for the transformer connected to terminals 1 and 2 is rated for 16.5 VAC and at least 40 VA.

4. Disconnect the transformer from terminals 1 and 2 and meter the battery at terminals 3 and 4. A fully charged battery should show 13.8 volts.

5. Make sure the battery is a 12 V sealed lead acid type. It should be rated at 7 Ah or greater, depending on the NFPA classification of the installation.

Noise on Long Wire Runs

EMI (ElectroMagnetic Interference) can cause problems on long wire runs for serial devices (command centers, POPITs, etc.). The use of shielded cable reduces the effect of this interference. Some potential sources of noise on a long wire run include:

*   Radio or television transmitter site.

*   Ham radio operator's transmitter site.

*   Computer network system.

*   Heavy machinery (large electrical motors).

*   PBX telephone system.

*   High voltage electrical equipment or transformers (arc welders, certain medical and dental equipment, etc.).

*   Public service office using radio communications (fire department, police department, etc.).

*   Close proximity to electrical lines, telephone cabling, or fluorescent lighting fixtures.

Noise on Long Wire Runs (Continued)

There are many other possible sources of noise. If you suspect that noise may be a problem, the use of shielded wire is strongly recommended. Connect the drain wire from the shielded cable to terminal 11 on the D7112.

The drain wire must have continuity from the panel to the last serial device on the wire run. If you cut the cable to install devices between the last device and the panel, be certain to reconnect the drain wire to insure continuity to the last serial device.

If continuity is not maintained between the panel and the last serial device, the shielded cable may aggravate potential noise problems rather than eliminate them. Connecting the drain wire to ground at other than terminal 11 on the panel may also produce problems. Do not connect the drain wire to any other ground source.

Specifications

Voltage Input

Primary Power Supply ① ②
16.5 VAC 40 VA class 2 plug-in transformer (D1640)

Secondary Power Supply ❹ ⑤
12 VDC 7 Ah sealed lead acid rechargeable battery. The D7112 supports a maximum of two 12 VDC 7 Ah batteries using the D122 Dual Battery Harness. If you install two batteries, use the D8103, D8109, or D8108A enclosure with the D7112M.

Current Requirements
Idle 130 mA

Transmitting 165 mA

See the *D7112 Standby Battery and Current Rating Chart* for the current requirements of other system components.

Power Outputs

Continuous Power Outputs ⑤㉗
1.2A maximum at 10.2 to 13.8 VDC (continuous supply) total for all devices and outputs supplied at terminals 5 and 27, and J2.

Alarm Power Output ⑦
2A maximum at 10.2 to 13.8 VDC output. Output may be steady or one of three pulsed patterns depending on programming. (See the *Relays* section of the *D7112 Program Entry Guide (74-06274-000)*)

Fire and Fire/Burglary Systems
To comply with UL 985 and 864 listing standards for fire alarm systems (effective March 1, 1989), the total combined continuous and alarm current draw for the system **during alarm conditions** must be limited to 1.2A (1200 mA) provided by the primary power supply (rectified AC). If current draw for the system exceeds 1.2A, connect at least one D8132 Battery Charger Module to the D7112. Each D8132 provides an additional 1.2 Amps of rectified AC power. Combined current draw must never exceed 3.0A.

Battery Discharge/Recharge Schedule

Discharge Cycle
13.8 VDC	Charging float level
11.8 VDC	Battery trouble report
10.0 VDC	Panel shuts down until AC is restored.
	Event log clears.

Recharge Cycle
AC ON	Battery charging begins, battery trouble and AC restoral reports sent.
12.8 VDC	Battery restoral report sent, battery float charged.

Minimum Operating Voltage
10.2 VDC

SDI Bus
SDI Bus A (+): 9 VDC (2,000' max)

SDI Bus B (-): 9 VDC (2,000' max)

Telephone Connections

Connection
RJ31X or RJ38X jack can be interfaced with the D7112.

Two TelCo Lines
Radionics D728 Dual Phone Line Module required for two phone line service. Supervision supplied by the panel.

Environmental
Temperature:	32°-122°F (0°-50°C)
Relative Humidity:	5-85% at 86°F (30°C) non-condensing

Arming Stations
D1254 Alpha III Command Center

D710 RF Command Center

Keyswitch

Point Thresholds

On-Board Point 1 (Powered Loop)

	Voltage	Resistance
Normal	12.3	1.8K Ω
Short	12.0	1.4K Ω
Open	12.9	3.8K Ω

Maximum current draw 79 mA (in alarm)

On-Board Points 2 to 8

	Voltage	Resistance
Normal	2.3	1K Ω
Short	1.85	.657 Ω
Open	2.93	1.6K Ω

J1 Keyswitch Thresholds

Arming Circuit
(Pins 2 and 4, Yellow and Black)

	Voltage	Resistance
Normal	2.4	1.0K Ω
Short	1.7	.592 Ω
Open	2.8	1.47K Ω

Compatible Enclosures

(All require the D7102 mounting skirt.)

D8103 Universal Enclosure

D8109 Fire Enclosure

D8108A Attack Resistant Enclosure

Compatible Accessories

D122	Dual Battery Harness (D8103, D8109, or D8108A enclosure required)
D125A	Powered Loop Interface Module
D126	12V, 7 Ah Rechargeable Battery
D127	Reversing Relay
D129	Dual Class A Initiation Circuit Module
D192A	Bell Circuit Supervision Module
D1254	Command Center
D268/D269	Independent Zone Control
D279	Independent Zone Control
D5200	Programmer
D5300	Remote Account Manager II
D710	Handheld RF Command Center
D7125	RF Receiver Interface
D8121A or D8122	Derived Channel S.T.U.
D8125X	POPEX Module
D8126	POPIT Module (standard)
D8127	POPIT Module (compact)
D8129	OctoRelay Module
D8130	Release Module
D8132	Battery Charger Module (D8103, D8109, or D8108A enclosure required)

M801 (6"), M802 (8"), M803 (10") Bells